

## ABSTRACT

The present invention provides a method of magnetic resonance investigation of a sample, preferably of a human or non-human animal body, said method comprising:

(i) nuclear spin polarising a solid MR imaging agent (i.e. a material containing in its molecular structure a non-zero nuclear spin nucleus) by

(a) spin refrigeration, or by,

(b) irradiating with circularly polarised light;

(ii) administering the nuclear spin polarised MR imaging agent to said sample, preferably after dissolution in a physiologically tolerable solvent and also preferably after separation from some or all of the paramagnetic species or chromophores;

(iii) exposing said sample to a radiation at a frequency selected to excite nuclear spin transitions in selected nuclei therein, e.g. the spin polarised nuclei of the MR imaging agent;

(iv) detecting magnetic resonance signals from said sample; and

(v) optionally generating an image, dynamic flow data, diffusion data, perfusion data, physiological data (e.g. pH,  $pO_2$ ,  $pCO_2$ , temperature or ionic concentrations) or metabolic data from said detected signals.